Musser Homestead Fuels Reduction Project Hydrology Report

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Project and Area Description

The Musser Homestead Fuels Reduction Project is proposing to reduce hazardous fuels on approximately 51 acres of National Forest System Land (NFS). The Musser Hill Trail, which runs through the project area, was rerouted due to erosion in 2017. Subsequent hazard tree falling left a high load of dead and down material in excess of 35 tons/acre within the project area. There is also a high concentration of ladder fuels within the project area, which can result in high intensity wildfire. Surrounding NFS lands have already had fuel reduction treatments completed, and this project would complement those and create an area that increases suppression capability and protects infrastructure within the Wildland Urban Interface, as well as reducing the potential for fire to escape private lands onto NFS lands.

The activities proposed include thinning and pruning to achieve the desired spacing and reduction in ladder fuels. The felled tree boles will be limbed, topped, and bucked into six to eight foot lengths. Firewood collection will be permitted where feasible. Hazard trees to the trails and private property will be felled. Activity-slash and natural surface fuels will be hand piled and burned. Chipping of these small fuels may occur where desired and possible. Repeated maintenance understory burning will occur on an interval conducive to a low-intensity fire.

The proposed project is located at Township 34 North, Range 9 West, Sections 29 and 32 (Mount Diablo Meridian). The project area lies to the east of East Weaver Creek Road and west of Forest Road 34N95, Musser Hill Road. Watersheds in which the proposed project is located are identified in Table *1*. Riparian reserves in the proposed action area are shown in *Figure 1*. About 0.47 acres of the proposed action lies within Riparian Reserve.

Table 1. Hydrologic units within the boundary of the proposed project.

Watershed (fifth field)	Subwatershed (sixth field)	Drainage (seventh field)	Subdrainage (eighth field)
Grass Valley-Weaver	Weaver Creek	East Weaver Creek	1801021106050104

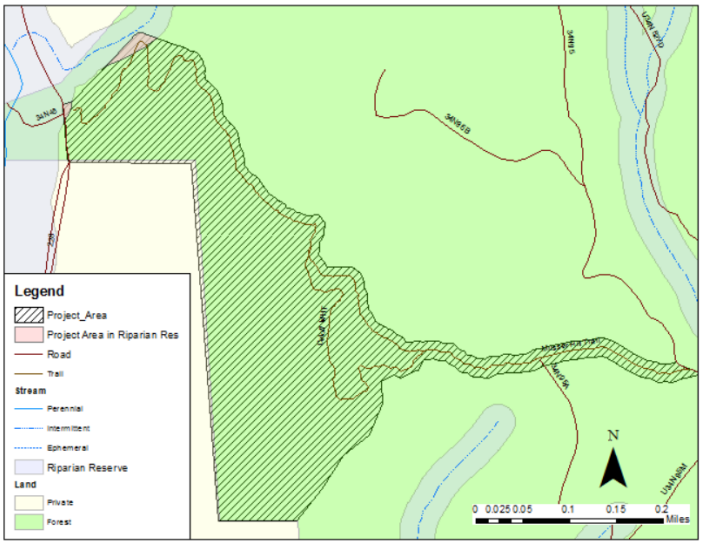

Figure 1. Map showing the proposed project area, streams, riparian reserves, trails, and roads.

Regulatory Framework

Land and Resource Management Plan

The *Shasta-Trinity National Forest Land and Resource Management Plan* (Forest Plan) provides guidance for the management of the Shasta-Trinity National Forest (Forest Service, 1995). The Forest Plan establishes direction for activities in designated Management Areas, and establishes Forest-wide standards and guidelines to fulfill National Forest Management Act requirements relating to management activities. Portions of the Forest Plan that are relevant to the hydrologic analysis of the proposed action are reproduced in the following sections.

Desired Condition

The Forest Plan embodies the desired future condition in its Goals and Objectives.

- Maintain or improve riparian habitat.
- Maintain or improve water quality and quantity to meet fish habitat requirements and domestic use needs.
- Maintain water quality to meet or exceed applicable standards and regulations.

Management Area

Management direction guidance found in the Forest Plan for the Weaverville/Lewiston Management Area includes:

- Plan and conduct management activities near trailheads and adjacent to trails to minimize effects on recreation use.
- Plan and conduct activities in East Weaver Creek so that water quality will be protected for domestic use.

Riparian Reserves

As a general rule, Standards and Guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives. Riparian Reserves are specified for five categories of waterbodies, three of which are relevant to the proposed action:

- Fish-bearing Streams – Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.
- Seasonally Flowing or Intermittent Streams – At a minimum, the Riparian Reserves must include the stream channel and extend to the top of the inner gorge; the stream channel and the area from the edges of the stream channel to the outer edges of the riparian vegetation; extension from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.

Aquatic Conservation Strategy Objectives

The Aquatic Conservation Strategy (ACS) objectives that are relevant to the proposed action are:

- Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.
- Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Key Watershed

The Grass Valley-Weaver watershed is not a Key Watershed.

Beneficial Uses

The uses of water designated within the Basin Plan for the North Coast Region of California are designated by the North Coast Regional Water Quality Control Board (NCRWQCB, May 2011). The beneficial uses for the East Weaver Creek drainage include: municipal and domestic supply; agricultural supply; industrial service supply; groundwater recharge; freshwater replenishment; navigation, contact and non-contact water recreation; commercial and sport fishing; cold freshwater habitat; wildlife habitat; rare, threatened or endangered species; migration of aquatic organisms; spawning, reproduction and/or early development; and aquaculture; as well as the potential for industrial process supply and hydropower generation .

Clean Water Act, Sections 303(d) and 305(b)

The goal of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Sections 303(d) and 305(b) of the CWA requires the states to biennially report to the U.S. Environmental Protection Agency on the overall quality of the waters of the United States within their state. States are required to submit to U.S. EPA a list identifying waterbodies not meeting water quality standards, and the water quality parameter(s) (i.e., pollutant) not being met.

The Trinity River and its tributaries are on California's 303(d) list of impaired waters (California Environmental Protection Agency State Water Resources Control Board, 2017). Required pollution controls are not presently sufficient to attain or maintain water quality standards for sediment.

Waiver, Order No. R1-2015-0021

The Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands in the North Coast Region (Waiver) addresses waste discharges to waters of the state from management activities that may generate sediment, affect shade canopy, or influence other water quality parameters. This project is a Category A project (phone conversation with Maggie Robinson, October 2018) as it has a low likelihood of impacts to water quality. Records of project activities must be kept for this project for review by Regional Water Board staff as deemed necessary.

Analysis

Cumulative Watershed Effects

An assessment of the potential for cumulative watershed effects is required for proposed activities in Region 5 (FSH 2509.22, 1988). It is known that there are management thresholds within watersheds, where if exceeded, the risk of cumulative effects increases significantly. An equivalent road area (ERA) model is utilized to make a preliminary assessment of watershed conditions by comparing effects of past, existing, and reasonably foreseeable actions to a watershed threshold of concern (TOC). All forms of management activities which have occurred in different time periods are normalized by relating the disturbed and compacted area of the activity to an area of road. The TOC for each watershed in the Shasta Trinity National Forest has previously been determined. More detailed analyses are required when ERA totals equal or exceed the TOC.

The assessments of the cumulative watershed effects for the proposed action and the recommended alternative have been completed. This project will increase the percentage of ERA at the HUC8 scale by 2.6 acres, or 0.1% of the total drainage area. Considered at higher level hydrologic units, the percentage decreases by an order of magnitude at each step. The results for the proposed action for the first year of disturbance are shown as follows in *Table 2*. The cumulative disturbance at each watershed scale is rated as low, except for Grass Valley – Weaver Creek, which is moderate. Low level disturbance means the ERA is less than 40 percent of the TOC. A moderate level means the ERA is between 40 and 80 percent of the TOC.

Table 2. Cumulative effects of the watersheds for the first year of the proposed action.

Hydrologic Unit	TOC	ERA	% of TOC	Disturbance Level
5 - Grass Valley – Weaver Creek	16.0%	6.4%	40%	Moderate
6 - Weaver Creek	16.0%	4.7%	29%	Low
7 - East Weaver Creek	16.0%	5%	31%	Low
8 - 1801021106050104	16.0%	5%	31%	Low

Best Management Practices

The use of Best Management Practices (BMPs) to control nonpoint source pollution to meet water quality standards and other requirements of the Clean Water Act are required by Forest Service policy (Forest Service, 2012). BMPs are to be implemented on all NFS lands to avoid, minimize, and mitigate adverse effects to soil, water quality, and riparian resources that will meet the intent of the Federal and State water quality laws, regulations, executive orders, and Forest Service directives. Numerous BMPs should be applied throughout the project. Additional BMPs that should be applied when working in a Riparian Reserve are mentioned below. The following BMPs are developed from *National Best Management Practices for Water Quality Management on National Forest System Lands Volume 1: National Core BMP Technical Guide* (Forest Service, 2012), and *Water Quality Management for Forest Systems Lands in California: Best Management Practices* (Forest Service, 2000).

Riparian Reserve Planning

Riparian Reserve planning - is to be utilized to maintain and improve or restore the condition of land around and adjacent to waterbodies. The quality and quantity of water resources may be adversely affected by ground-disturbing activities that occur in these areas. Designation of a zone encompassing

these areas adjacent to a waterbody is a BMP. As mentioned previously, the watersheds within the proposed action area are listed as impaired due to sediment. There is a perennial fish-bearing stream to the west of the project boundary (East Weaver Creek) and the Riparian Reserve overlaps the northwest corner of the project area. There is an intermittent tributary to East Weaver Creek on the northern most border of the project area which is potential fish habitat. Activities to the south of the trail should not impact that Riparian Reserve. For this project the Riparian Reserve and Equipment Exclusion Zone (EEZ) widths for each stream category are the same: 300 feet for the fish-bearing stream (East Weaver Creek) and 100 feet for the intermittent stream (unnamed tributary to East Weaver Creek).

Erosion Prevention and Control Measures

The following BMPs must be implemented to control sedimentation.

- Conduct operations reasonably to minimize soil erosion.
- Do not operate equipment when ground conditions are such that excessive damage will result.
- Control overland runoff.
- Maintain erosion controls in functional condition, especially during precipitation events and prior to forecasted storms.
- Utilize chipping and lop and scatter to provide ground cover where practicable to slow runoff, improve infiltration, and capture sediment.

Streamcourse and Aquatic Protection

Activities within a Riparian Reserve should be conducted in a manner that maintains or improves riparian and aquatic values (Region BMP 1-19). Sediment entering stream courses should be controlled.

- Hand pile and burn outside the Riparian Reserve of any stream channel.
- Hazard trees within the Riparian Reserve will be felled and left on site unless this results in excessive fuel loading.
- Hand piles of thinned fuels will be placed in a checkerboard pattern whenever possible.
- Do not operate mechanized equipment in the Riparian Reserves.
- Do not operate mechanized equipment on slopes >35%.
- Avoid piling and burning at the bottom of swales.
- Maintain sufficient ground cover to encourage infiltration, avoid or minimize erosion, and to filter sediment.
- Avoid, minimize, or restore detrimental soil compaction.
- Mark the boundaries of the Riparian Reserve and EEZs on the ground before land disturbing activities.
- Alter prescribed fire prescriptions and control actions in the Riparian Reserve as needed to maintain ecosystem structure, function, and processes and onsite and downstream water quality.
- Avoid or minimize complete removal of the organic layer when burning in riparian areas or wetlands to maintain soil productivity, infiltration capacity, and nutrient retention.
- Set target levels for desired ground cover remaining after burning based on slope, soil type, and risk of soil and hillslope movement.
- Plan burn areas to use natural or in-place barriers that reduce or limit fire spread, such as low fuel hazard areas, streams, or wetland features to minimize the need for fireline construction.
- Conduct prescribed fires to minimize the residence time on the soil while meeting the burn objectives.
- Construct fireline to the minimum size and standard necessary to contain the prescribed fire and meet overall project objectives.
- Rehabilitate or otherwise stabilize fireline in areas that pose a risk to water quality.

- Alter prescribed fire prescriptions and control actions in the Riparian Reserve as needed to maintain ecosystem structure, function, and processes and onsite and downstream water quality.
- Avoid or minimize complete removal of the organic layer when burning in riparian areas or wetlands to maintain soil productivity, infiltration capacity, and nutrient retention.

Extraordinary Circumstances

A proposed action may be categorically excluded from further analysis and documentation in an EIS or EA only if there are no extraordinary circumstances related to the proposed action (FSH 1909.15 Chapter 30). Resource conditions that should be considered in determining whether extraordinary circumstances related to a proposed action warrant further analysis and documentation in an EA or an EIS include flood plains, wetlands, and municipal watersheds. The mere presence of one or more of these resource conditions does not preclude use of a categorical exclusion. It is the existence of a cause-effect relationship between a proposed action and the potential effect on these resource conditions and if such a relationship exists, the degree of the potential effect of a proposed action on these resource conditions that determine whether extraordinary circumstances exist.

- Flood Plains; not mapped by the Federal Emergency Management Agency for this area. Flood plains may exist along East Weaver Creek and the unnamed intermittent tributary at the north end of the project area and are likely coincident with the Riparian Reserves.
- Wetlands; the National Wetlands Inventory has mapped the unnamed intermittent creek at the north end of the project area as a riverine wetland as well as East Weaver Creek. These riverine wetlands consist of the stream channel, the stream banks, and a small distance further (less than the Riparian Reserve width).
- Municipal watersheds; East Weaver Creek is the source of a portion of the Weaverville municipal water supply and there are numerous landowners that also use this creek for domestic water uses.

This project will have a negligible effect on water quality as long as no equipment use or burning occurs in the Riparian Reserve. Protecting the Riparian Reserve areas will concurrently protect the flood plains and wetlands and ensure minimal impact to water quality. Sedimentation caused by this activity will be insignificant with BMP implementation and will not negatively affect municipal watersheds. Thus, no extraordinary circumstances are foreseen as a result of this fuels reduction project.

References

California Environmental Protection Agency, State Water Resources Control Board. 2017. 2014 and 2016 California integrated report Clean Water Act sections 303(d) and 305(b).

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